REMARKS

In the Office Action, the Examiner again rejected claim 5 pursuant to 35 U.S.C. § 102(b) as being anticipated by Smith et al. (U.S. Patent No. 5,311,095). Claims 6-8 and 10-11 were rejected pursuant to 35 U.S.C. § 103(a) as being unpatentable over Fiebiger et al. (U.S. Patent No. 5,418,759) in view of Shiraishi et al. (U.S. Patent No. 6,788,620). Applicants respectfully request reconsideration of the rejections of claims 5-8 and 10-11, including independent claim 5.

Claim 5 has been amended for clarity and has not been narrowed. "Matching layer" as used in the art is for acoustic impedance matching. To expedite allowance, the claim has been amended to specifically indicate this known meaning.

Independent claim 5 recites transducer material arranged as an array of elements, where the array is a multidimensional array of M x N elements with both M and N greater than 1, and at least two electrically conductive matching layers on the transducer material.

Smith et al. do not disclose the at least two electrically conductive acoustic impedance matching layers limitation as noted by the Examiner. The Examiner then alleges it would have been obvious to one of ordinary skill in the art to provide multiple impedance matching layers in lieu of a single layer for the simple expedient of more efficient matching. Applicant respectfully disagrees. First, the motivation cited by the Examiner, more efficient matching, does not suggest both layers to be conductive. Second, there is no reason to use multiple conductive layers given the Smith et al. teaching of a foil by the first layer. Since a grounding plane is provided, the more widely used and possibly more efficient acoustic impedance matching of a non-conductive layer for the second layer would have been used. Due to the lack of motivation to provide two conductive matching layers, a person of ordinary skill in the art would not have provided two conductive acoustic impedance matching layers.

The Examiner later notes in a different rejection that the conductivity or lack thereof is only an issue of convenience and that materials are mainly selected based on their acoustic impedance values and not for their conductivity. Given this selection criteria, there is no showing of a desired combination of matching layers that are both conductive and have desired acoustic impedance. To get the optimum acoustic impedance, there is no showing that two conductive layers would be convenient.

The Examiner rejected dependent claims 6-8 with references not also used to reject independent claim 5. Accordingly, dependent claims 6-8 are allowable for the same reasons as claim 5 from which they depend. Fiebiger et al. and Shiraishi et al. do not disclose a multidimensional array of M x N elements where M and N are both greater than 1. Claim 5 is allowable over Fiebiger et al. and Shiraishi

et al. The Examiner alleges Fiebiger's disclosure of rectangular tomographs and the Fig. 2 matching layer in plan view as being more or less square indicates a two-dimensional array. However, a rectangular tomograph is a two-dimensional image. As known in the art, a two-dimensional image is typically generated with a one-dimensional array. Fiebiger even notes use of a linear array for creating the rectangular tomograph (col. 3, lines 25-29). The rectangular tomograph teaching provides for a one-dimensional array, not a two-dimensional array. Figure 2 is a micrograph extending over about 450 μm. This level of magnification clearly indicates the layer being for a single element, so also does not suggest a two-dimensional array (NxM with M and N each being greater than 1) of elements.

The Examiner notes that one- and two-dimensional arrays are known in the art. While true, there is still no suggestion to use the structures of Fiebiger with a multi-dimensional array. There is also no suggestion to provide two conductive matching layers in the structure of Fiebiger. Fiebiger desires a simple construction having a uniform matching layer (col. 1, lines 59-63) that performs shielding and electrode functions (col. 2, lines 6-11 and 61-64). A multi-dimensional array increases complication, so a person of ordinary skill in the art would not use the structures of Fiebiger with a multi-dimensional array. Claims 6-8 and 10-11 are patentable since Fiebiger and Shiraishi do not suggest use on a multi-dimensional array.

Regarding Fiebiger and Shiraishi in combination, the Examiner alleges that an alternative of two conductive layers is just as likely as one without in view of the specific metal constructions of Shiraishi. However, Shiraishi, et al. explicitly prefer a non-conductive layer. Shiraishi et al. disclose a specific type of two-layer structure (Col. 7, lines 46-60). To provide the structure, ceramic or ceramic and glass with filling material are preferably used (Col. 10, lines 16-30). Inorganic, organic or both types of materials may be used, but a ceramic or ceramic and glass is preferred (Col. 13, line 59 – Col. 14, line 7). Shiraishi et al. prefer a nonconductive material, so a person of ordinary skill in the art would not have used the matching layers of Shiraishi et al. in a two conductive matching layer arrangement of Fiebiger et al.

The Examiner also alleges whether to have two or one conductive layers is a matter of convenience. As discussed above for claim 5, there is no suggestion that two conductive layers are convenient given the acoustic impedance criteria.

Claim 6 recites kerfs defining the elements through the transducer material and the matching layers. Fiebiger et al. and Shiraishi et al. do not disclose this limitation. Shiraishi et al. use a single element, and Fiebiger et al. do not kerf through the matching layer. The Examiner notes kerfing as being known to avoid cross-talk. However, the claimed kerfs are not just for the elements, but also the matching layers. The cited art does not suggest kerfing through the matching layers.

Claim 7 recites three matching layers. Fiebiger et al. and Shiraishi et al. do not disclose three matching layers. Shiraishi et al. mention a plurality of matching layers, (Col. 3, lines 52-59), but only discloses two.

Claim 11 recites signal traces connected with one of the layers where kerfing separates the matching layer. Fiebiger uses the conductive layer with a ground potential common to all elements, not separated and connected to signal traces.

CONCLUSION:

Applicants respectfully submit that all of the pending claims are in condition for allowance and seeks early allowance thereof. If for any reason, the Examiner is unable to allow the application but believes that an interview would be helpful to resolve any issues, he is respectfully requested to call the undersigned at (650) 694-5810 or Craig Summerfield at (312) 321-4726.

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